PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

Patent Office
Canberra

I, JONNE YABSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2002952186 for a patent by JOHN JAMES STEINFORT and NEIL FREDERICK EDNEY as filed on 22 October 2002.

WITNESS my hand this
Thirteenth day of October 2003

J R Yabsley

JONNE YABSLEY
TEAM LEADER EXAMINATION
SUPPORT AND SALES

AUSTRALIA

PATENTS ACT 1990

PROVISIONAL SPECIFICATION

for the invention entitled:

" Tagging Animals "

The invention is described in the following statement:

TAGGING ANIMALS

Field of the Invention

The present invention relates in general terms to improvements in or relating to animal tagging and to methods for tagging animals. More particularly, but not exclusively, the invention relates to an improved tag label or like means (hereinafter referred to as "a tag") for use with animals for a range of purposes which may include allowing for ready identification and/or tracking thereof (for whatever reason).

Background of the Invention

In accordance with the known art, the tagging of animals for purposes of ready identification, tracking or monitoring of movements, etc has involved the use of a tag or the like means of a unitary kind having first and second portions held together, at or adjacent an extremity of each portion, by an intermediate region. The arrangement is such that a distal extremity of a first portion can be passed through an aperture made in the ear of the animal, for example, with the overall tag then being arranged such that the intermediate portion rests positioned through the ear and the respective first and second portions extend, at least to some extent, over the ear of the animal. Such a form of tag has enjoyed wide acceptance and is applied by taking an appropriate applicator or tool to make a hole in the ear of the animal (be it a sheep, cow, horse or in fact any type of animal, domestic or otherwise) just in from an edge thereof, then prising the respective first and second portions of the aforementioned tag apart so as to enable one of those portions to be inserted through the hole thus created, the two portions then being manipulated into such a condition that the intermediate portion rests through the hole formed in the ear of the animal, thereby to allow the respective first and second portions to assume a substantially parallel configuration. It has been found, however, that such tags, despite their long-standing market acceptance, have nonetheless exhibited certain drawbacks or disadvantages. To be

more specific, and by way of example only, there exists a significant possibility of such a tag or identification means being deliberately or inadvertently displaced or removed, as for example by the animal rubbing its ear – or for that matter the relevant part of its anatomy where any such tag is located – against any given surface, catching the ear on any form of obstacle, etc. As well, readability of an ear tag can often present difficulties.

It is an object of the invention to provide a tag which obviates or ameliorates one or more of the aforesaid difficulties.

Disclosure of the Invention

The invention provides in one aspect an animal tag comprising,

a penetrating component having two ear penetrating members joined by a strip of intermediate material,

a complementary component having a locking portion for each penetrating member, and

ramp means for each locking portion,

wherein the arrangement is such that the ear penetrating members are designed to be passed through the ear of an animal and to lock onto the locking portions of the complementary component to sandwich the ear in a gap between the penetrating component and complementary component and the ramp means are arranged to co-operate with the skin penetrating members to vary the size of the gap whereby to provide a range of gap sizes to accommodate varying ear thicknesses and/or growth of the animal.

Either of the two components may be fitted with a transponder. The transponder may include means to identify the animal electronically and/or to locate the animal and/or to allow it to be tracked. The transponder may be located on the intermediate material. The transponder may include aerial means. The aerial means may comprise a coil which lies substantially co-planar with the plane of the intermediate material.

For a transponder arranged in this fashion, an aerial directed parallel to the plane of the coil may be used for efficient generation and reception of electrical signals between the transponder and the aerial.

The penetrating component and/or complementary component may be formed of plastics material. They may each be integrally formed of plastics material. They may be formed of polyurethane, rubber, combinations of these two or other similar materials. The penetrating members may additionally or alternatively include hard material such as hard plastic or metal to assist with piercing of the ear.

Suitably, the plastic forming the material of the penetrating component may generally be a plastic of a softer shore hardness than the material of the complementary component. This is to allow the penetrating component to flex more readily in a manner which will be described hereinafter.

The ear penetrating members of the penetrating component may end in an ear piercing head. The ear piercing head may have a generally arrow head shape. It may be joined to a tubular portion of the ear penetrating member which connects to the intermediate material. The join between the tubular portion and the arrow head may define a step between the two which may be suitable for causing locking with the locking portion of the complementary component.

The locking portion of the complementary component may comprise a slot. It may be designed so that the arrow head may be snap fitted or twisted through the slot so that the step of the arrow head catches underneath the bottom sides of the slot.

The complementary component may have two such slots which are joined by a joining portion which sits higher than the level of the slots.

The ramp means may be provided beneath each of the slots. The ramp means may slope from a thicker ramped portion more centrally in the complementary component towards a thinner portion at the edges of the complementary component.

In an alternative embodiment of the invention, the transponder may be attached to the complementary component. It may be located in a tubular member attached to the joining portion of the complementary component. It may be housed in the tubular portion with an aerial coil coaxial with the axis of the tubular portion. In such an instance, the aerial should again be placed to extend in a plane parallel to the plane direction of the coils in the transponder.

It is noted that the location of a transponder for higher frequencies is preferably on the penetrating component as it will be positioned on top of the ear. A lower frequency transponder may be located in a housing associated with the complementary component underneath the ear. A high frequency transponder may typically operate in the MHz range typically at about 13.56 MHz whereas a low frequency transponder may typically operate in the KHz range at about 134.2 KHz. A marker may be attached to the complementary component. It may be attached via attachment to the housing for the transponder. Thus it may be arranged to hang from beneath the ear of an animal to which the tag has been attached.

In another aspect, the invention provides a method of tagging the ear of an animal comprising applying a tag as hereinbefore described to the ear of the animal so that the two ear penetrating members are located to pass through the top of the animal's ear with both ear penetrating members located between vascular ridges running lengthwise along the underneath surface of the ear. In the case of high frequency transponders, suitably, the tag will be located closer to the head of the animal for cattle than to the distal extremity of the ear. For sheep the tag may be located closer to the distal extremity. In each case the tag should suitably be located on the horizontal part of the ear.

It has been found that animals tagged in this way are less likely to suffer from damage to the ear if care is taken to avoid the vascular ridges. Also, there is less likelihood of the tag being removed by the animal rubbing the ear if it has two points of attachment.

Preferred aspects of the invention will be now be described with reference to the accompanying drawings.

Brief Description of the Drawings

Figure 1 shows an exploded view of an animal tag according to the invention;
Figure 2 shows an exploded view of an animal tag with transponder secured in place;
Figure 3 shows the animal tag of Figure 2 assembled;
Figure 4 shows a plan view of an implant tool;
Figure 5 shows the animal tag about to be applied to a sheep's ear;
Figure 6 shows the animal tag applied to a sheep's ear;
Figure 7 shows a view of the animal tag prior to application to the ear;
Figure 8 shows the animal tag applied to an ear;
Figure 9 shows the animal tag applied to an ear after the animal has grown;
Figure 10 shows an alternative form of animal tag; and
Figure 11 shows the animal tag of Figure 10 applied to the ear of a cow.

Detailed Description of the Drawings

The various elements identified by numerals in the drawings are listed in the following integer list.

Integer List

1	Animal tag
3	Penetrating component
5	Locking component
7	Transponder
8	Coiled aerial
9	Ear penetrating member
10	Tubular portion

11	Ear piercing head
12	Step
13	Joining strip
15	Opening
17	Locking slot
19	Joining portion
21	Ramp
23	Recessed portion
25	Implant tool
27	Implant pin
29	Body
31	Projection
33	Sheep's ear
34	Gap
35	Vascular ridge
37	Aerial
50	Locking component
52	Tubular holder
54	Marker
56	Cow ear
57	Transponder
58	Coil
67	Aerial

Referring to Figures 1 to 3, there is shown an animal tag 1 which comprises a penetrating component 3, a locking component 5 and a transponder 7.

Both the penetrating component and locking component may each be formed of injection moulded plastics material such as polyurethane or polyurethane/rubber.

The transponder has a coiled aerial 8 which lies in the plane of the joining strip 13 joining the two ear penetrating members 9 on either side of the penetrating

component. It is noted that the ear penetrating members are located very close to the opposed edges of the joining strip 13 so as to leave little or no scope for an animal to be able to catch the edge under a wire or branch to remove the animal tag.

Each of the ear penetrating members comprises a tubular portion 10 with walls having a thickness range generally between 0.2 and 1mm, more preferably 0.4 to 0.8mm. Each of the tubular portions terminates at one end in a join with the joining strip 13 leaving an opening 15 for purposes to become apparent.

The other end of the tubular portion in each instance is provided with the ear piercing head 11 in the form of an arrow head, the join between the tubular portion and arrow head forming a step 12. It can be seen from Figure 3 that the step 12 can lock underneath the edges of the ramp 21 forming part of the locking component.

The ear piercing heads may include cutting edges of a material such as hardened plastic or steel to assist with pushing the arrow heads through the ear of an animal.

It should also be noted that the arrow head forming the ear piercing head may have a hexagonal cross section. It may be snap or force fitted through the locking slots 17 formed in the locking component.

The joining portion 19 between the two locking slots is raised relative to the height of the locking slots for purposes to become apparent. A recessed portion 23 is formed under the joining portion 19.

The underneath edges of the locking slots are formed as ramps 21 which are in the form of wedges, the thicker end of the wedges being nearer the centre of the locking component tapering to a thinner edge towards the outer edges of the locking component.

For this purpose, an implant tool 25 shown in Figure 4 may be used in association with a tag applicator to apply the tag to the ear of an animal. Applicant's co-pending

international application PCT/AU02/00508 describes how an applicator could be used in this fashion. The disclosures in the said international application are by this cross reference deemed to be incorporated herein. It can be seen that the implant tool 25 includes two implant pins 21 which are shaped so that they can fit snugly through the openings 15 and into the tubular portions 10 of the ear penetrating members 9. The implant pins serve to hold the ear penetrating members rigid as they would otherwise collapse when they are pressed into the ear of an animal.

The implant tool 25 also includes a body 29 joining the two implant pins and a projection 31 upon which pressure may be exerted to bear down upon the implant pins and hence push the ear piercing heads through the ear.

Referring to Figures 5 and 6, it can be seen that the tag is applied to the ear of a sheep closer to the edge of the ear than to the head with the ear penetrating members between and aligned with the vascular ridges 35. By applying the tag in this fashion, it is held in a secure position in a firm manner. The fact that the locking component and the skin penetrating heads are held clear of the vascular ridges serves to reduce the likelihood of inflammation or infection being caused to the animal by attachment of the tag.

Referring to Figure 8, the animal tag is shown after it has been fitted to a sheep's ear 33. The joining portion 19 has a radius which mimics the curvature of the internal surface of the ear to reduce irritation produced by movement of the tag. Typically, the radius of curvature will lie between 3mm and 6mm. For sheep it may be about 3.5mm and for cattle it may be about 5mm.

It can be seen that the joining portion 19 because it is raised, sandwiches the ear 33 between the penetrating component and locking component leaving small gaps 34 between the ear and the ear penetrating members 9. By designing gaps of this type, there is room for air to contact the small wounds caused by penetration of the ear and hence the rate of healing of the wound can be improved and infection minimised as

infection of ears from prior art tagging processes tends to occur on the inside section of the ear.

Because the coils of the transponder lie parallel to the plane of the joining strip 13, it is preferred that the orientation of an aerial 37 be parallel to this plane in order to maximise efficiency of transmission between the two. Thus the aerial 37 may typically extend above a race.

Referring to Figure 9, the drawing shows the change in appearance of the tag as the animal grows from the size shown in Figure 8. With normal growth, the thickness of the ear may increase and also the length. This results in the ear penetrating members 9 splaying outwards and kinking or collapsing in the manner shown in Figure 9 so that the arrow heads are located at the narrower portion of the wedge or ramp 21. This in turn creates a greater clearance between the top of the joining portion 19 and the bottom of the joining strip 13 thereby accommodating an increase in the thickness of the ear whilst at the same time accommodating growth in the length of the ear as well.

Because the walls of the tubular portion are relatively thin they can compress and, they will only exert slight resilient pressure to hold the tag in place whilst still allowing sufficient flexibility to accommodate growth in the manner described. The same feature also accommodates different animal sizes in a similar fashion.

Referring to Figures 10 and 11, the alternative form of tag shown therein differs from that in the previous drawings in that the locking component 50 includes a tubular holder 52 attached directly to the locking component. In turn, a marker 54 is attached to the tubular holder.

The tubular holder forms a housing for the transponder 57 having a coiled aerial with the axis of the coils in line with the axis of the tubular holder.

As can be seen from Figure 11, the tag can be applied in a similar manner to that described with reference to the earlier drawings with the marker tubular holder and transponder hanging down from within the ear. Here the tag is applied in a depression between the vascular ridges, on the upper rostral surface of the ear pinna.

Because of the direction of the coils, it is preferred that a vertical aerial running perpendicular to the axis of the coils or in other words parallel to the plane of the coils be used to send signals to the transponder.

It is to be understood that the word comprising as used throughout the specification is to be interpreted in its inclusive form ie. use of the word comprising does not exclude the addition of other elements.

It is to be understood that various modifications of and/or additions to the invention can be made without departing from the basic nature of the invention. These modifications and/or additions are therefore considered to fall within the scope of the invention.

Dated this 22nd day of October 2002

John James Steinfort and Neil Frederick Edney

by their patent attorneys Morcom Pernat

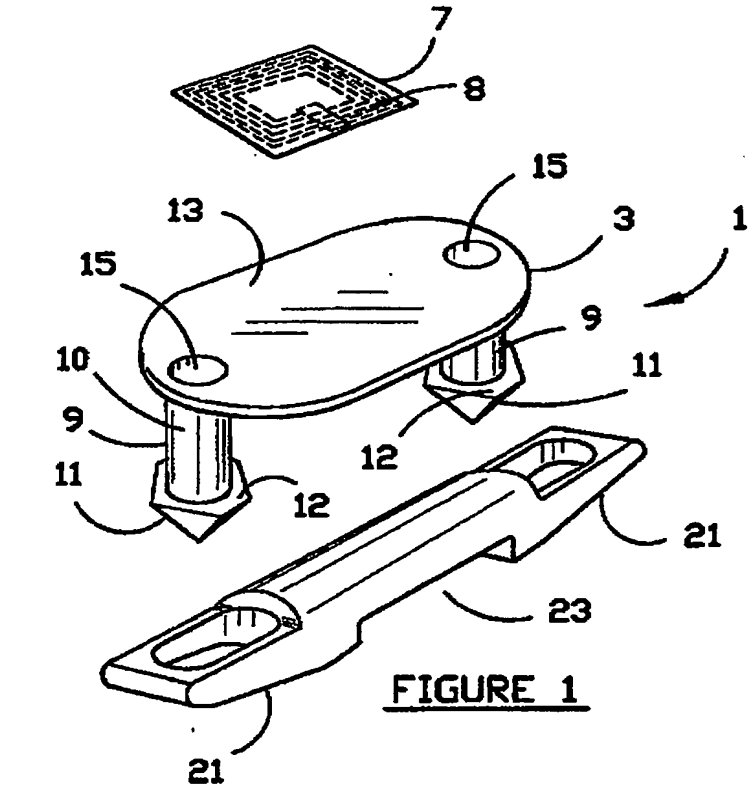

FIGURE 1

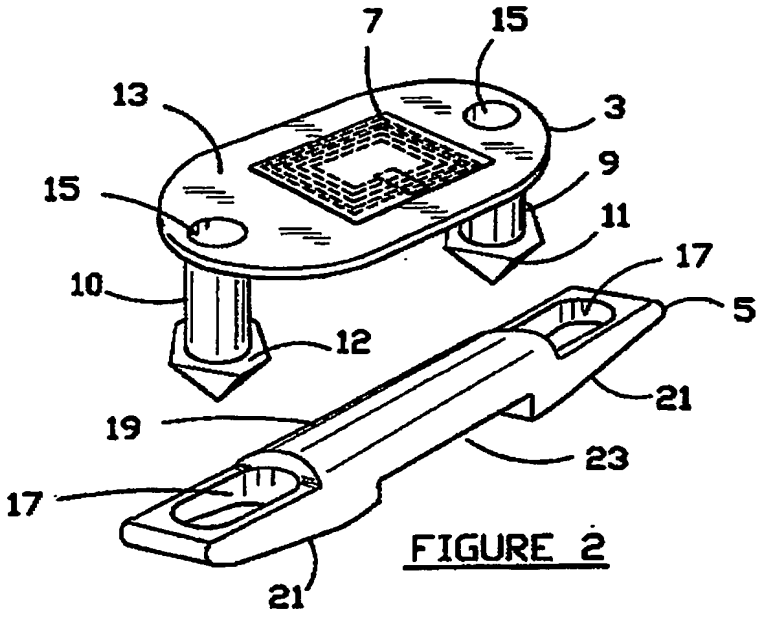

FIGURE 2

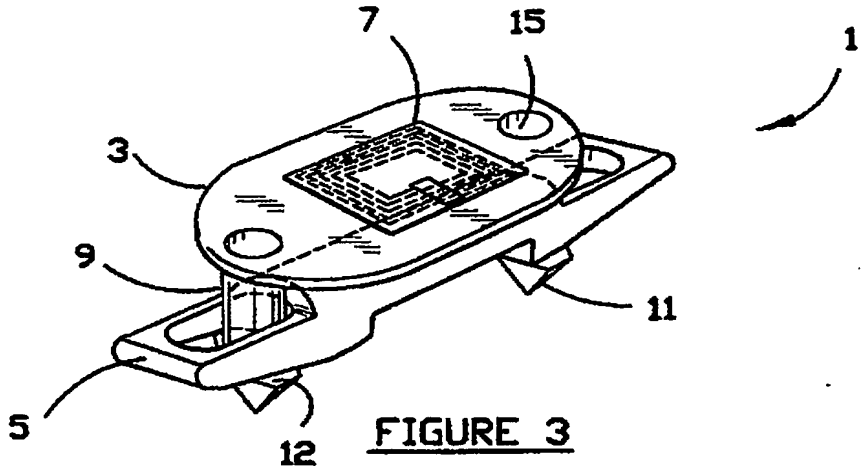

FIGURE 3

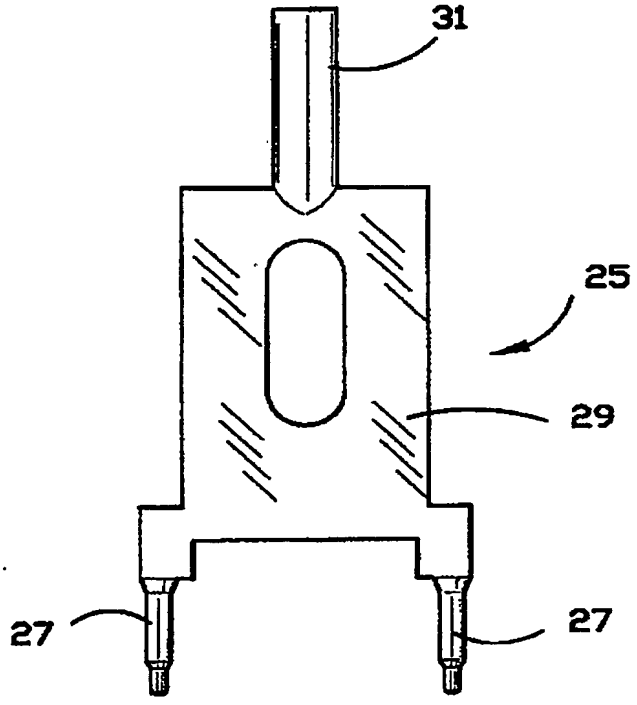

FIGURE 4

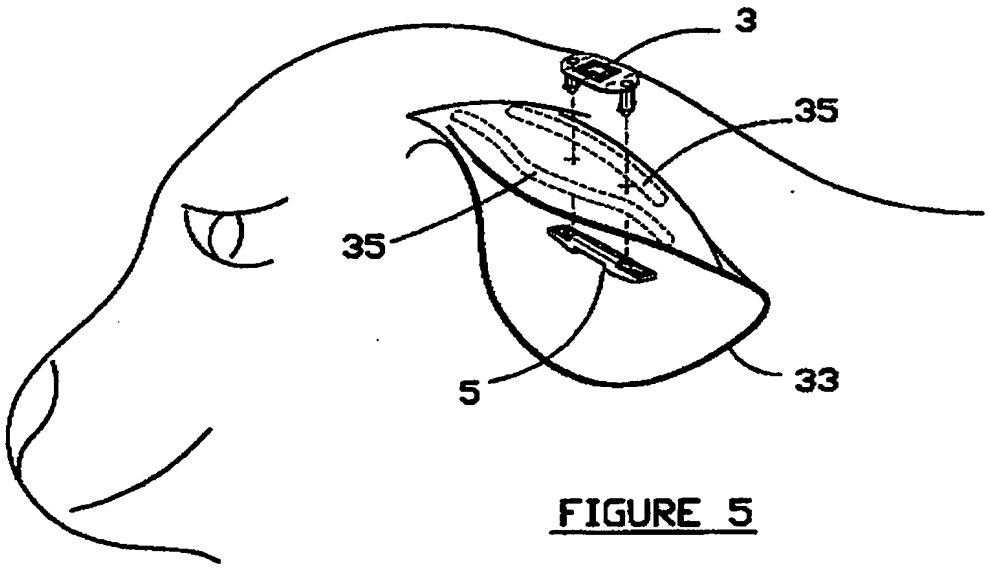

FIGURE 5

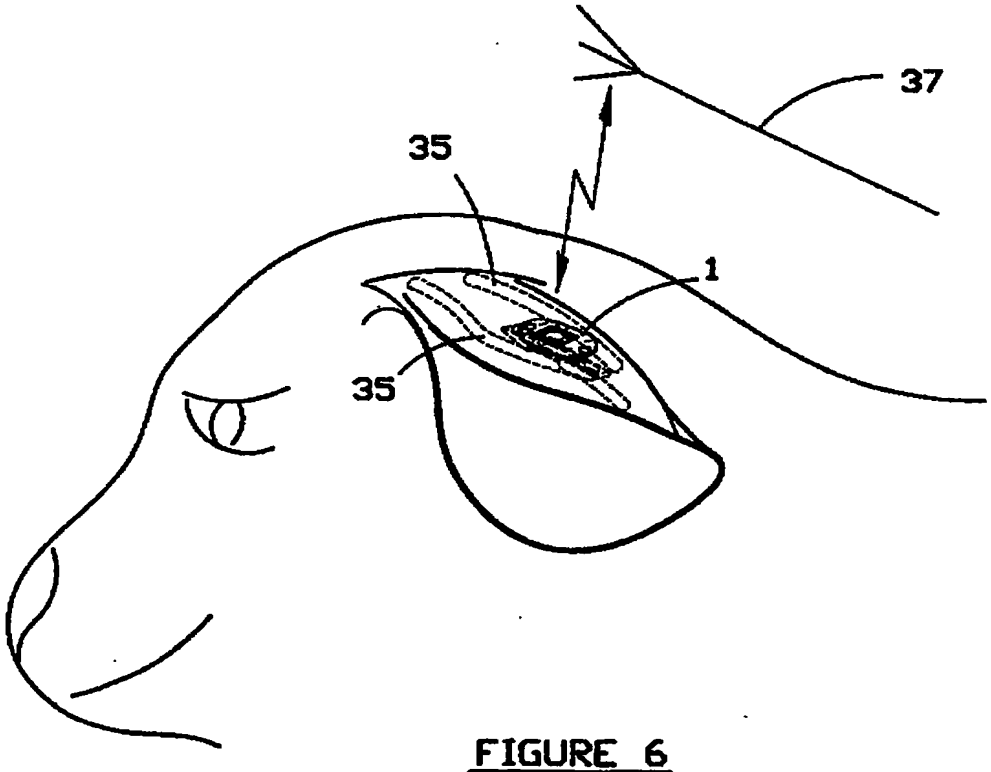

FIGURE 6

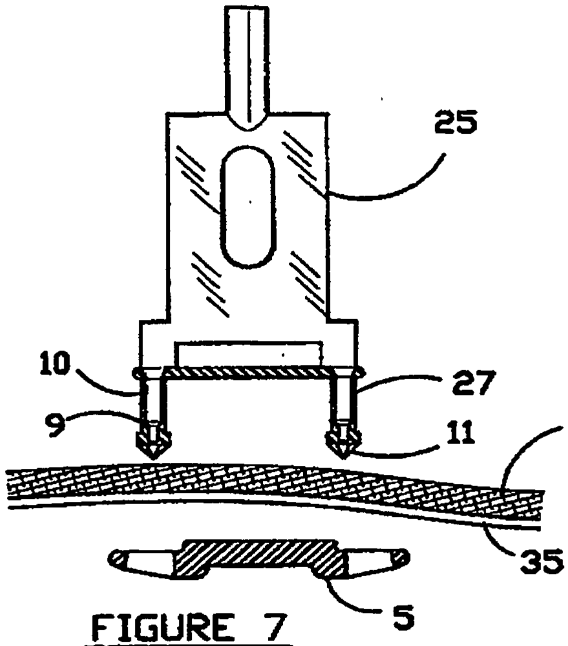

FIGURE 7

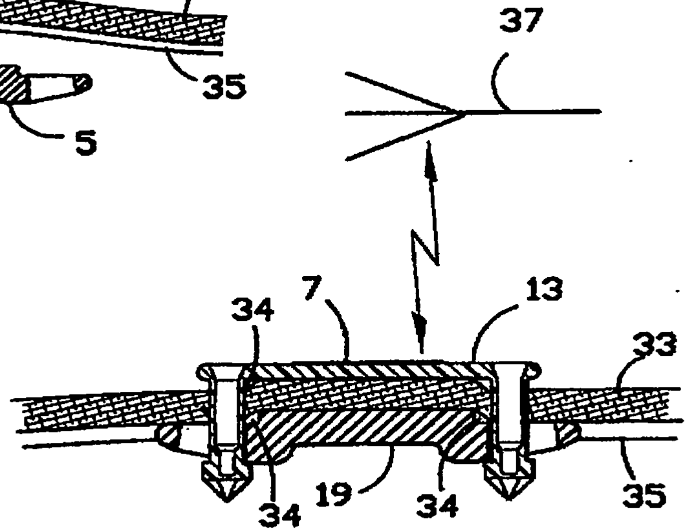

FIGURE 8

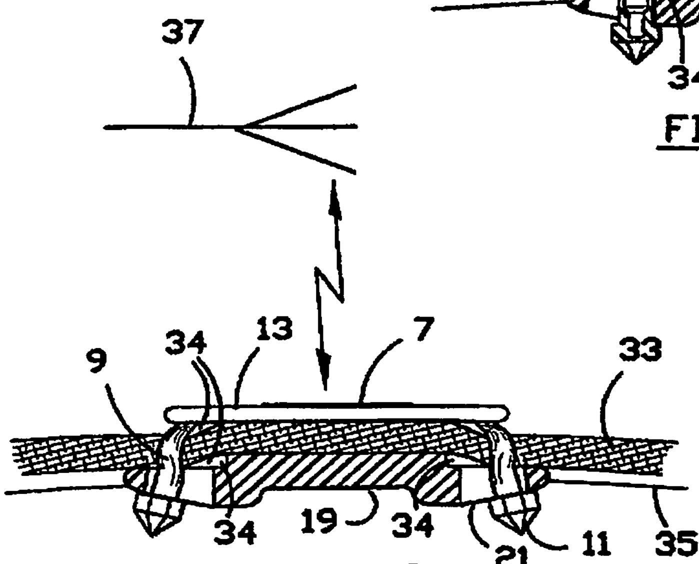

FIGURE 9

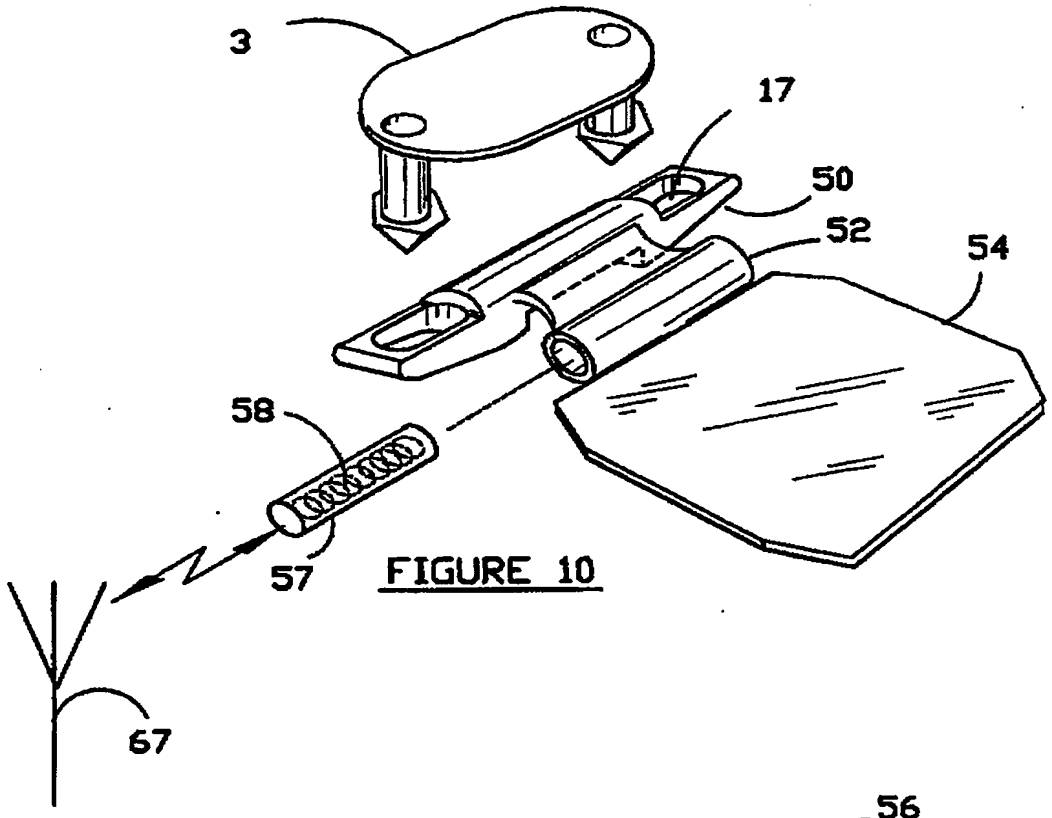

FIGURE 10

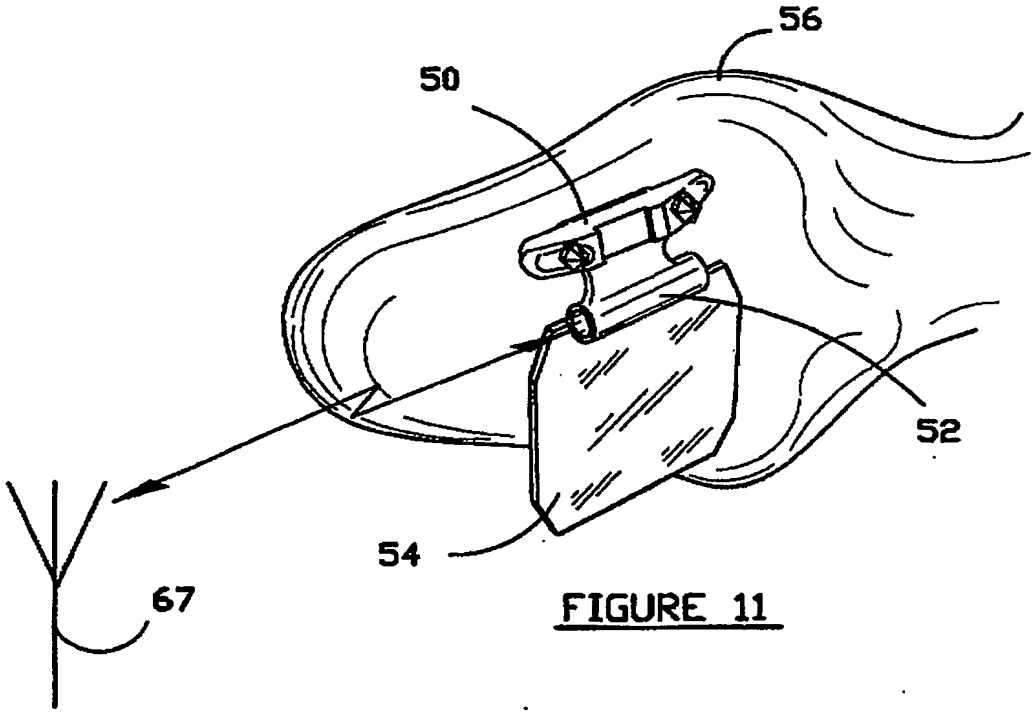

FIGURE 11